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Six Sigma: Does quality process make error-free care truly achievable?

Is new model 'flavor of the month,' or the Holy Grail of quality?

Of all the quality tools that have been imported from the business world to the health care setting, perhaps none has achieved the notoriety or the cult status of Six Sigma. In fact, some supporters claim that Six Sigma is succeeding where total quality failed.

Coined by Motorola in the mid-1980s, Six Sigma, in simplest terms, refers to a quality measure that seeks to approach perfection — a data-driven technique for eliminating defects, or in medical terms, errors. To a manufacturing engineer, for example, that means producing fewer than 3.4 defects per million opportunities. **(See key components, p. 75.)**

With an industrywide emphasis on reducing errors, particularly in the wake of the landmark Institute of Medicine report, it's no wonder Six Sigma has caught the attention of quality managers. But is such an approach realistic in a profession some argue is more art than science? Is it even realistic to strive for perfection in health care?

Many quality professionals respond with a resounding "yes."

"Our participation in Six Sigma is a recognition that we really want to support the idea of zero-defect care," says **Traci Atherton**, RN, BSN, vice

Key Points

- Striving for "perfection" is seen as an admirable quality goal.
- Evidence-based therapies and diagnostic tools support a scientific approach to error reduction.
- Six Sigma often is most effective in addressing "untouchable" quality issues.
- Partnering with corporations helps strengthen learning and implementation processes.

president of clinical support at Baylor Grapevine hospital in Grapevine, TX. She explains that the Six Sigma approach "preaches that quality is not optional. It's big, big picture stuff for facilities that are trying to get the fewest possible errors. If we want to talk about an error-free environment, we must explore how we would actually work toward perfection, to be a zero-error facility. What will our programs look like, and what do we need to do to achieve success?"

To Atherton, Six Sigma really is a change in focus to some of the key areas of process management. "The goal is to implement a care delivery system that avoids reliance on memory — that sets up processes that eliminate every opportunity for error," she explains.

"It's a myth that there's so much variation in medicine it becomes an art," says **Walter H. Ettinger**, MD, MBA, executive vice president of Virtua Health System in Marlton, NJ.

"The fact is, there are evidence-based therapies and diagnostic tools where there should be very little variation in use. One of the things quality professionals in health care have tended to focus on is the individual; what Six Sigma does is it allows you to focus on the process. Six Sigma really lends self to health care, particularly in the area of safety," he says.

Cutting out the waste

"There's a lot of waste in health care," adds **Carol P. Mullin**, RN, MSN, a Six Sigma "black belt" at Virtua. **(See related story on Six Sigma's black belt, p. 76.)** "We've had a lot of eye-opening experiences when we looked at process. Take transport, for example. On any given day, we had six transporters who were sent two to six times a day to pick up a patient.

"When they got there, their patient had either been moved, had died, or had been discharged. But the way our information systems were set up, that information didn't get around," she adds.

"That's up to 24 or 36 times in a day we could re-deploy transporters. Six Sigma enables you to quantify these processes; we're all used to looking at temperature or blood pressure, but we aren't used to counting the things we do."

"Six Sigma helps you focus on root causes," adds Mullin. "You do a statistical equation to help you figure out what percentage contribution a particular 'X,' or factor, has on 'Y.' If you only have the resources to put in three of six changes, you want to go with the ones with the highest percentile effect. This approach works very well with physicians because they are scientists. It's most gratifying; we've not gotten any arguments from physicians."

Getting your feet wet

There are a number of reasons for health care facilities to become involved with Six Sigma, just as there are many ways to do it. "We were intrigued by the issue of Six Sigma primarily because our culture has been to look at models outside of health care," notes **Randall Linton**, MD, incoming president and CEO of Luther Midelfort-Mayo Health System in Eau Claire, WI.

"That led us to look at the Motorolas, the GEs, and the Allied Signals, particularly as they have ventured into Six Sigma in service industries," Linton explains.

After initial research, including some discussions with the Boston-based Institute for Healthcare Improvement (IHI), Linton and his colleagues looked for opportunities to learn more about Six Sigma training.

"The Carlson School of Business at the University of Minnesota, which is right in our backyard, had found a way for companies to come together, to look at Six Sigma, and to work on a specific project," he notes. "They, in turn, teamed up with Blue Fire Partners for faculty support."

About 18 months ago, formal training began, as a team from Luther Midelfort, including Linton, selected a specific project to work on, billing, and began to learn and to work together

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with the other companies, many of whom were not health care organizations. "We benefited from that collaboration and interaction," he notes.

Virtua also had the help of corporate partners. "Our system was formed in 1998 as the result of a merger," recalls Ettinger. "During 1999, we spent a lot of time consolidating corporate departments and putting together an integrated management team and a single board. In early 2000, we decided we wanted to distinguish ourselves by creating an outstanding patient experience."

This led to the creation of the "Star Initiative," whose goals included becoming a nationally recognized health system; having patient satisfaction in the 90th percentile; and winning the Governor's Award for Excellence, which is New Jersey's equivalent of the Malcolm Baldrige Award. **(Incorporating Six Sigma into a larger initiative may be a prerequisite for success. See related story, p. 77.)**

"So now we had our goals, but how would we achieve them?" asks Ettinger. "We created a partnership with GE to have them teach us their Six Sigma methodology. We wanted a set of tools to really help us drive the five aspects of the outstanding patient experience: resource stewardship, a caring culture, clinical quality, excellent service, and the best people." The partnership was a natural, as GE was a large medical equipment vendor for the system and had a well-known reputation in Six Sigma circles.

"[Mullin] and the five other black belts have

Key components of the Six Sigma process

For many of the uninitiated, Six Sigma has taken on an almost mystical quality, and truth be told, on many levels, you've got to do it to understand it. Visit Six Sigma chat rooms and web sites, and one of the toughest challenges often cited is the difficulty of explaining Six Sigma "in 25 words or less."

At many companies, Six Sigma is no more or no less than a measure of quality that strives for near perfection, and there are many different frameworks in use. However, there are two major submethodologies: DMAIC (define, measure, analyze, improve, control) and DMADV (define, measure, analyze, design, verify).

The DMAIC process, the most common approach to Six Sigma, is an improvement model for existing processes that fall below specified levels, while DMADV is used to develop new processes or products. Both processes are executed by Six Sigma black belts and green belts and overseen by Six Sigma master black belts.

At the web site www.isixsigma.com, QPR, a Six Sigma consulting firm, further breaks down some of the key process components as follows:

- ✔ **Define:** Define the core process.
- ✔ **Measure:** Measure the existing system and establish reliable and valid measures.
- ✔ **Analyze:** Analyze findings, define the gap between as-is state and should-be state.
- ✔ **Improve:** Create new ways to do things; re-engineer the process; validate improvements by simulations and statistical methods; create project plans; instigate changes through contemporary communication (i.e., intranet/Internet).

Another firm, Advanced Systems Consultants (ASC) of Scottsdale, AZ, outlines its Six Sigma process with what it calls a "phased approach":

- ✔ **Phase I: Executive strategy**
  Presentation of an overview of the Six Sigma program to the executive leadership of the organization, to help them crystallize their vision and lead them through the strategy to implement it within their particular organization.
- ✔ **Phase 2: Performance indices**
  Identify the critical business issues and their respective performance indices for their organization. Establish a baseline, goals, and the impact of the Six Sigma performance indices.
- ✔ **Phase 3: Process classification**
  Classify the processes according to their impact on the critical business issues and Six Sigma performance indices and define projects and studies.
- ✔ **Phase 4: Resource designation**
  Designate teams, their leaders (black belts) and members (green belts), and assign them to specific projects and studies.
- ✔ **Phase 5: M/PCpS standardization**
  Training, standardization, and deployment of ASC's proprietary five-stage methodology for process characterization, optimization and control — for all team members and leaders.
- ✔ **Phase 6: Program review**
  Periodic review of the projects and studies assigned to the teams and their impact on the Six Sigma performance indices and critical business issues.

(See Perez-Wilson M. "Six Sigma strategies: Creating excellence in the workplace." Web: www.qualitydigest.com. Go to December 1997 issue.) ■

gone through rigorous training and were certified just like they would be at GE," explains Ettinger. "They took three days of CAP [Change Acceleration Process] and three of GE Workout coaching training, then 13 days of Six Sigma. Then came a six-month process to lead their teams through the program."

The black-belt candidates were chosen from among the system's best managers, says Ettinger. "Our goal is to have all six return to management positions in the organization and take their skills with them," he explains. "We didn't add any positions; we took them out of their positions and compensated by not adding FTEs [full-time equivalents]."

In addition, 60 people were trained as Star coaches, who are capable of leading both CAP and Workout. **(For more on the GE Workout, see *QI/TQM*, March 2001, p. 30.)** Senior management also received five days of training to help ensure their support.

Baylor Grapevine is in the early stages of its Six Sigma experience, but Atherton has a pretty clear idea of where she'd like to go. "We're going to look at checklists, protocols, reminders, standardized equipment, forms, times, and locations, so that you avoid that reliance on memory," she says.

"Right now, you could walk onto floor 2, 3, or 4 as a nurse, and no two floors would look the same or would have the same equipment. If you want to avoid the chance for human error, those things have to all be similar," she adds.

Atherton says her facility will be looking at products and devices that could fail, such as IV connections. "We'll also be taking a look at processes — how many steps are required — and seeing that patient care processes are designed with built-in opportunities to recover from error. All of this is being budgeted for this year."

The proof of the pudding

How have the Six Sigma experiments been going? "We have really started to see significant results," says Linton. "What we've been looking at is making sure the right party is billed for a service. It sounds like a very simple goal, but it can be complicated, especially as insurances change."

Linton says he's found that Six Sigma tends to be best applicable for the "untouchables" — those large projects no one seems to want to tackle, or knows how to tackle.

What is a black belt?

Like many facets of Six Sigma, the term "black belt" appears shrouded in mystery to the uninitiated. Author Thomas Pyzdek defines a Six Sigma black belt as follows:

"Candidates for technical leader [black belt] status are technically oriented individuals held in high regard by their peers. They should be actively involved in the organizational change and development process. . . . Because they are expected to master a variety of technical tools in a relatively short period of time, technical leader candidates will probably possess a background in college-level mathematics, the basic tool of quantitative analysis.

"College-level course work in statistical methods should be a prerequisite. . . . Successful candidates should understand one or more operating systems, spreadsheets, database managers, presentation programs, and word processors. As part of their training, they will be required to become proficient in the use of one or more advanced statistical analysis software packages."

Source: Pyzdek T. "What is a black belt?" Web: Http://www.qualitydigest.com/. Go to February 2000 issue.

"Billing fit the requirements laid out in the book *The Six Sigma Way*. There was a significant gap between current and desired performance; the cause was not clearly understood; and an optimal solution was not apparent," he notes. *(Cavanagh R, Neuman R, Pande P.* The Six Sigma Way: How GE, Motorola, and Other Top Companies Are Honing Their Performance. *New York City: McGraw-Hill; 2000.)*

Through Six Sigma's strong emphasis on identifying and prioritizing customers, Linton's team discovered that not only were patients the key customers, but customer service reps also were key customers of the process. "We found we had created a process that made it very difficult for them to do a good job," Linton notes.

The team developed a job description within which it was possible for the customer service reps to be successful, and many of the leading indicators in terms of backlogs and days in accounts receivable are showing very positive trends, Linton reports.

"It think we'll find that the investment in our project will be recouped many times over," he predicts, adding that "Six Sigma gives us the advantage of prospectively looking at potential

solutions and determining the predictability of their success. I'm not sure we would have come up with the same solution without it."

A total of six projects are ongoing at Virtua. "In all of them, we've been able to define what the goals are and what measures will be used, processes for follow-up, and improvement plans," reports **Erich Florentine**, vice president for operations improvement.

"Two projects were focused on: recruitment and retention. In recruitment, we identified processes that were tied up for five to 10 days and cut that down to zero to one day," notes Florentine, who worked for GE before joining Virtua. "On a project in the emergency department, we looked at patient satisfaction and time to the treatment area. Based on two months' data, there actually was improvement, but of course, we're looking for long-term, sustained improvement."

"Our pilot starts on June 19," Mullin reports. "We're looking at length of stay for congestive heart failure patients. We had heavy data collection in February and March, after which the average dropped from 6 to 4.3; our goal is 4.2. I wonder if the data collection had a 'halo effect'; naturally, I want to have the whole summer to look at."

Linton is so high on Six Sigma that two more teams have completed their training, and two more projects are in process. "One continues to look at issues in billing; the other is hospital patient flow," he says. "We are convinced that the applicability of Six Sigma into other clinical areas has promise, and we want to continue to pursue it." ■

Six Sigma 'not the way to learn how to walk'

Take it from those who know: If you're just beginning to implement quality improvement programs at your facility, Six Sigma is not for you. And even if you have a lot of experience under your belt, be aware that Six Sigma is not a one-size-fits-all solution to your quality problems.

"You must recognize that if this is your first step into continuous improvement, Six Sigma is not the way to learn how to walk," warns **Randall Linton**, MD, incoming president and CEO of Luther Midelfort-Mayo Health System in Eau Claire, WI. "Your background in quality will significantly enhance your experience.

"Prior to looking at Six Sigma, our organization had a greater than 10-year history of continuous improvement," Linton continues.

"This is a very crucial point. We found from our experience, and in working with the [Boston-based] Institute for Healthcare Improvement as one of our strategic partners, that using a variety of different models and methods is a good approach," he points out.

"With that history, we have evolved to the point where we started to look at Six Sigma about two to three years ago and to investigate what it might mean for us," Linton says.

"I think your chances of success will be greater if Six Sigma is used in the context of a systemwide initiative, such as our current Star Initiative," adds **Walter H. Ettinger**, MD, MBA, executive vice president of Virtua Health System in Marlton, NJ. "It's a tool to achieve a goal. Also, you have to be willing to put significant resources into this; you've got to have perseverance and patience."

Six Sigma addresses but one component of success in performance improvement, he adds. "We refer to the equation, Q [quality] x A [acceptance of the new process] = E [effective results]. Six Sigma is the quality component of the solution."

"If you only do the Six Sigma piece, you won't get there," adds **Carol P. Mullin**, RN, MSN, a Six Sigma black belt at Virtua. "If you do it by itself,

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it's too little. Getting the 'Q' piece is an improvement, but the 'Q' side is easy in health care; you're never going to be successful unless you work out the 'A' pieces. And in health care, we're not too good at the 'A.' Around here, we like to say, "It's the 'A,' stupid! That's what makes for lasting change."

Finally, cautions Linton, Six Sigma is not the tool to use for every project — just the untouchables. "For example, [Plan Do Study Act] is a big part [of our quality improvement process] and will continue to be. Six Sigma is another tool in the toolbox. In many areas, other models are much simpler and cheaper." ■

Leapfrog Group spawns CPOE systems testing

Move is third initiative for safety group

The Washington, DC-based The Leapfrog Group has engaged two organizations — First Consulting Group of Lexington, MA, and the Institute for Safe Medication Practices — to develop testing criteria and methodology for evaluating the effectiveness of hospitals' computer-based physician order entry (CPOE) system implementations.

The system, which should be ready by October, will be available to hospitals free of charge. **(For The Leapfrog Group's CPOE criteria and other facts and figures, see box, p. 79.)**

This is the third of the group's initiatives to improve patient safety and quality of care; the other two are the delivery of intensive care by specialists and referrals to high-volume hospitals for common procedures.

Key Points

- The computer-based physician order entry system, which will be available this fall, will be free of charge.
- Appeal to consumers seen as key to getting hospitals on board.
- Participants may be offered incentives such as higher reimbursement rates.
- Users will be able to identify percentage of errors being intercepted.

"The way we chose our agenda was to go to all the leading patient safety gurus and say, 'If we wanted to come up with the health care equivalent of anti-lock brakes or seat belts, what would we do?'" explains **Suzanne Delbanco**, PhD, executive director of The Leapfrog Group.

"We were told we should focus on things that would make a big difference in reducing medical errors, that were extremely well evidence-based, and that were extremely easy for the average American to understand," she says.

"If we say doctors have bad handwriting, which can lead to errors, and we can eliminate many of those errors by using computers, most consumers would respond, 'Why not?' And in part, our initiatives should be consumer-driven. We also knew a lot of research is being done, and that the research today shows that CPOEs will make a big dent in reducing errors. Lastly, we needed to make sure that whatever initiatives we focused on would be easily ascertainable by outsiders."

Despite the fact that CPOEs have been shown to effectively reduce errors, fewer than 5% of the hospitals in the United States currently use such a system, according to Leapfrog. One of the major barriers, it notes, is cost.

Nevertheless, the need for greater accuracy in this area is clear. "The medication management process in hospitals is a highly manual and a highly complex process, and ripe for improvement in a variety of ways," notes **Peter Kilbridge**, MD, practice director for First Consulting Group.

"Information management and medical management processes are so information-intensive that it makes them good targets for automation," he says.

"The average physician ordering drugs needs to know not just that particular patient and his or her medical problems.

"The physician must also be aware of or be able to refer quickly to all drugs the patient is on, allergies, relevant lab data, and any diagnoses other than the one the patient has been admitted for. All of these have implications for dosing selection."

The task at hand

"Our job with Leapfrog is not just to compare systems; The Leapfrog Group's desire is to incentivize hospitals to implement [CPOEs]; that is its specific intention," notes Kilbridge. "[It has] already indicated that it expects hospitals to

implement our recommendations, so the next question is how to determine for the public at large whether a hospital has done what it says it would do . . . in a fashion that promotes patient safety."

Today, most of the systems that have been implemented don't do that, Kilbridge continues. "So, The Leapfrog Group asked us to come up with a specific approach to evaluating — to design a test approach — to help hospitals evaluate and report the way their system is implemented and used, and if it actually accomplishes the kind of high-value decision support required for patient safety.

"In other words, we will try to come up with a test methodology and specific orders so that hospitals will be able to qualify for the Leapfrog criteria," he says. "Our approach is based on using the available data in the field to help us further determine what those criteria are, and to help hospitals move in that direction. As much as possible, they will be based on the current literature."

"First Consulting will enable us for the first time to make the effectiveness of a CPOE system more transparent," notes Delbanco.

"For example, we'll be able to determine what proportion of serious errors the system is intercepting. We want be able to create a test that makes the system more transparent to consumers as well.

"It also will be used by hospitals for their own QI purposes," she points out. "They will have a standard methodology for assessing a lot of system components — checking for drug / drug interaction, whether it catches patient allergies, if dosages are correct for patient height and weight, lab values, and so on. It will report specifics — and it will be very, very technical."

Getting others to take action

The Leapfrog Group's goal, of course, is to reduce serious medical errors; to do that, it must encourage health care facilities to follow its recommendations. "We don't want to be overly prescriptive," says Delbanco, "but the CPOE is the most effective way we know of reducing errors today. We won't specify what software to buy, or how the equipment should be programmed; there isn't one obvious leader. But we do want hospitals to put in effective systems."

According to Delbanco, the way to enhance compliance is to encourage patients to choose hospitals that have CPOEs, and encourage more hospitals to put systems in place.

"I think most of the leverage will occur at the local level," she says. "On the national scale, there's no doubt we have had an impact. We believe it's really about providing a business case [for CPOEs].

"We will have a report coming out in few weeks on the economic implications of all three of our initiatives, which will include research on costs, savings, and to whom they accrue —

The Leapfrog Group's CPOE Patient Safety Standard

According to the Washington, DC-based Leapfrog Group, hospitals that fulfill the standard on computer-based physician order entry (CPOE) will:

1. Require physicians of patients in hospitals to enter medication orders via a computer system that is linked to prescribing error prevention software.
2. Demonstrate that their CPOE system can intercept at least 50% of common serious prescribing errors, utilizing test cases and a testing protocol specified by The Leapfrog Group and developed by the Institute for Safe Medication Practices and First Consulting Group.
3. Require documented acknowledgement by the prescribing physician of the interception prior to any override.
4. Post the test case interception rate on a Leapfrog-designated web site.

A recent study by David Bates, MD, chief of general medicine at Boston's Brigham and Women's Hospital, demonstrated that CPOE reduced error rates by 55% — from 10.7 to 4.9 per 1,000 patients.[1] Rates of serious medication errors fell by 88% in a subsequent study by the same group.[2]

References

1. Bates DW, Leape LL, Cullen DJ, Laird N, et al. Effect of computerized physician order entry and a team intervention on prevention of serious medication errors. *JAMA* 1998; 280:1,311-1,316.

2. Bates DW, Teich JM, Lee J, Seger D, Kuperman GJ, et al. The impact of computerized physician order entry on medication error prevention. *JAMA* 1999; 282:313-321. ■

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the hospital, the insurer, and so on," Delbanco says. "There will be some really good returns on investment reported."

Also, she notes, all of the organization's members (which include many members of the Fortune 500) have agreed to recognize and reward hospitals that meet Leapfrog standards.

"It may be a blue ribbon award that can be used in marketing campaigns to channel enrollees, or higher reimbursement rates," notes Delbanco. "Those decisions will be informed by discussions between hospitals and employers. In some markets, hospitals want more patients, while in others, they want higher reimbursement." ■

Statistical analysis reduces OR costs

Staffing costs smaller in seven of nine suites

Statistically derived staffing solutions resulted in anesthesia staffing plans with costs that were at least 10% less than the costs of the plans used by managers in seven of nine surgical suites, in a study conducted by **Franklin Dexter**, MD, PhD, of the University of Iowa College of Medicine in Iowa City.

The software, CalculatOR, was developed by Medical Data Applications Ltd. of Jenkintown, PA. It combines previously published algorithms giving the smallest possible staffing costs with graphical and inferential tests.

"That gives you a significant trend over time, and also indicates that, based on what has happened in the past, this is what will happen in the future," Dexter explains. "This software incorporates tests I've used over several years."

The CalculaTOR software was used to assess weekday anesthesia group staffing at nine independently managed surgical suites that were concerned about costs. Staffing and operating room [OR] data from those suites were used to test whether the statistical method could identify staffing solutions that covered all cases, but for which nurse anesthetist costs were less than those in plans implemented by the groups' managers.

Dexter has some thoughts about why a purely statistical analysis would results in lower costs than those devised by people, even though those people clearly were charged with controlling costs.

"First of all, there is not any one answer for a given surgical suite," he explains. "In one hospital, it was recently decided, politically, that it would not decrease first-case-of-the-day starts. Our analysis showed, for example, that Mondays raised the relative cost of under- and overutilized hours. We used that value for the best distribution of OR time to maximize efficiency."

Some of the managers had too many rooms, and some had too few, Dexter says, but often those decisions were made on a political basis. "What we asked was, given the number of rooms, what is the best way to staff?" he notes.

Managers also tend to do the same thing every day of the week, says Dexter. "They try to keep it simple. But the computer doesn't care whether people are covering on weekends or on afternoons."

It's more than just money

In his study, Dexter focuses on staffing costs, because that was the task with which he was charged. "Although we talk about costs," he notes, "the mathematics actually maximize the efficiency of use of operating time. The client wanted information for internal use, where the goal was to reduce costs. What the math actually

Key Points

- Costs are reduced by at least 10% compared with plans devised by managers.
- There is no single right answer for surgical suite staff planning.
- Mandatory — but planned — overtime is a key to operating room efficiency.

does is maximize efficiency use of time. If you do that, you will naturally reduce costs. You won't minimize costs, but you will maximize the efficiency use of operating time."

This is an important distinction when dealing with physicians, Dexter notes. "Some say that politically, surgeons don't want to hear about another cost-saving measure. However, they will listen to plans to improve efficiency."

In addition, he points out, the data he derived were only for the nurse anesthetists. "However, I would say the staffing analysis also would apply identically to nurses. After all, it's no good to have an anesthesia provider there without an operation, and therefore OR nurses. Thus, you could extend the analysis to operating room staff productivity."

Is mandatory overtime a good thing?

Another issue that arises from the study is mandatory overtime. At many surgical suites, including those studied, surgeons and patients can schedule elective cases on whatever future workday they choose; thus, there is no limit on the number of cases performed each workday. Cases are scheduled in each OR without planned delays between cases, and overtime is essentially mandatory.

"This isn't spur of the moment, unplanned overtime, but you have to have it," says Dexter. "We mean mandatory in the way a particular health care system might mean it. The way to practically implement it is set things up where you have three teams who plan on staying late if necessary."

Is that a threat to quality? "Theoretically, yes, but practically, no," Dexter asserts. "If people who stay late planned it, if they are not surprised and if they are paid overtime, and if you have planned the proper number of ORs and staff efficiently, it should not have that much effect on quality.

"Could it happen that one of the surgeons decides he'd like to work until midnight? It could, and I don't know if that's good or bad. I am very amenable to the argument that it could be bad because of the number of work hours. But I'm also amenable to the argument that the patient needs surgery, so getting the care done could be good. For health care systems, what's most important is that this not be unexpected overtime."

If a facility says as part of its mission statement that "we are here to take care of all patients on whatever workday the surgeons and patients choose," then there isn't a concept of overscheduling, says Dexter.

"Instead, what you're saying is, 'We have a service commitment,'" he observes. "Then, the concept of overscheduling goes away. The question becomes, how do we provide appropriate staff to give safe care?"

Taking a statistical look at OR staffing also can lead to a reevaluation of your physical plant, Dexter offers. "Let's say you have five ORs; you do the analysis, and it says you need seven ORs. You have your mission statement; you plan your staffing to increase efficiency and to keep productivity high. If your option is to plan not to have an eight-hour work day, but a 13-hour work day, that probably tells your administration that you need more ORs." ■

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Brief intervention curbs fibromyalgia's impact

Interdisciplinary program only 1½ days

The most effective treatment of chronic diseases such as fibromyalgia must, like the diseases themselves, be implemented over a period of months, or even years . . . Right?

Not necessarily. A brief interdisciplinary program at the Mayo Clinic in Rochester, MN, has achieved meaningful improvement in patients in terms of how they were affected by their symptoms.

On follow-up, for example, 70% showed improvement in their score on the Fibromyalgia Impact Questionnaire (FIQ), including bad days per week, pain severity, fatigue, "awaken refreshed," stiffness, and nervousness and anxiety. MPI (Multidimensional Pain Inventory)

Key Points

- Follow-up questionnaire shows 70% improvement in symptom self-scoring.
- Patient misinformation can lead to deleterious lifestyle behaviors.
- Self-care seen as key to effectively ameliorating fibromyalgia symptoms.
- Nurses, rheumatologists, and physiatrists participate in program.

scores also demonstrated significant improvement in the areas of pain severity, interference, and general activity level.

How can such significant improvement be achieved with a program of relatively brief duration? "I think one reason why brief intervention is helpful is that many patients, and for that matter doctors, don't have a clear idea of what fibromyalgia is," says **Lois E. Krahn**, MD, of Mayo's department of psychiatry and psychology. "There are many forms and symptoms, and a core component of our program is education, to provide the patients with more scientifically based knowledge than many of them, unfortunately, have had in the past."

For example, she notes, some people with fibromyalgia feel they should be more sedentary to prevent pain, and they don't know that moderate exercise actually can be beneficial. "This may induce them to lead lifestyles that would exacerbate their symptoms," she explains. "By being better informed, they hopefully will make better choices."

In addition, even this brief intervention can make a big difference in the ability of the patient to provide optimal self-care, which is very important in fibromyalgia patients. "They learn what kind of exercise is best; they learn stress management techniques, how best to function in the employment sphere. All of this is addressed," Krahn explains. "What's sad for me is that in many cases, no one had ever talked to them, for example, about what to do at work."

The program crammed a lot of activity into a brief period of time. During the first half-day, patients were evaluated by a nurse and a physician. This included medical, physical, psychological, educational, and pharmacological assessments.

The second half-day consisted of a nurse-led course emphasizing self-management. This included written materials, lectures, and group discussions about these topics:

- what fibromyalgia is and is not;
- the cycle of pain;
- stress management;
- relaxation;
- planning for difficult days;
- sleep hygiene;
- anger management;
- communication skills;
- coping skills;
- perfectionism;
- personal responsibility.

The third segment included both occupational and physical therapy components led by physical and occupational therapists. Written materials, lectures, group discussions, and interactive demonstrations were used to teach the patients how to manage their condition. In the physical therapy component, exercise, stretching, and moderation specifically were emphasized. In the occupational therapy component, proper body mechanics and energy conservation were emphasized, Krahn says.

Follow-up is critical

Because the post-treatment outcome measures and other follow-up information were mailed to the patients one month after the intervention, patient compliance after the intervention clearly was critical to the success of the program. In the case of the Mayo program, the more severely affected patients showed the most improvement, which surprised even Krahn. Why was the program so successful?

"One important piece was the people involved with it," she offers. "One reason we established the program was that patients had been less than satisfied with their care; but the physicians who were treating them were also less than satisfied. Now, we've identified staff who enjoy working with these issues, and they have volunteered to work in our center."

In effect, she says, fibromyalgia patients are no longer seen exclusively by rheumatologists; they are seen by the whole volunteer staff.

"Beforehand, patients might have been seen by

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health care professionals who actually were experts in other diseases. Now, we have very talented nurses, rheumatologists, and physiatrists who want to treat fibromyalgia patients." In addition, she notes, with this multidisciplinary approach, "we are better able to meet the needs of any individual patient."

Krahn feels the results of this program should give hope both to fibromyalgia patients and to those who care for them. "Sometimes with a disease like this, people get very pessimistic; they feel nothing can be effective in relieving its symptoms," Krahn observes. "The basic take-home from this study is that these patients not only deserve attention, but that there are treatments that are effective. These patients are very high utilizers of health care, and there is great potential for this kind of intervention to reduce their need for ongoing medical care." ■

Sight, sounds of nature ease pain of procedure

Bronchoscopy patients achieve 43% improvement

Patients who were distracted during and after bronchoscopy by the gurgle of a brook and a pastoral mountain mural were 43% more likely to report pain control as either very good or excellent in a recent study conducted by Johns Hopkins Medical Institution in Baltimore. The study was conducted in the summer of 2000.

"During previous patient studies, we had found what we thought was a surprisingly high amount of pain — more than we were comfortable with — despite the use of a fair amount of

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medication to try to prevent pain," notes **Gregory Diette**, MD, MHS, assistant professor of pulmonary and critical care medicine at Hopkins. "This despite the fact that we err on the high side in this area."

In light of this situation, a particular form of distraction therapy called Bedscapes, provided by Healing Environments International of Woodstock, NY, sounded very attractive to Diette and his colleagues. Bedscapes incorporates what are known as "biophilic" images and sounds, he explains.

"One definition of biophilic is those sights and sounds that provoke a positive or healing response in people who are sick," Diette says. "Common features involve nature, the color green, images of water and trees — often spaced apart."

There were two selections available to Hopkins — a mountain scene, or a beach scene with ocean sounds and sea gull cries. "We just preferred the mountain option; we felt it would do a better job," says Diette.

The mural was a 42 inch by 52 inch photograph of a mountain stream in a spring meadow that was mounted by the bedside in the recovery area and mounted from the ceiling in procedure rooms. A continuous tape of sounds — water in a stream, birds chirping, and so on — was played with a portable tape player and used with headphones by the patient.

Diette was not surprised with the results. "Biophilic images and nature sounds fit into the general area of distraction therapy," he notes. "For example, in pediatrics, when kids have blood drawn, it's not unusual to have someone distract them. I have seen studies using PET scans that show that when people are distracted, there is a difference in blood flow to areas of the brain where pain is perceived. It's quite possible there's a region in the brain that's not getting signals it would have gotten if the patients were not distracted."

Other applications possible

Diette and his fellow researchers theorize this type of therapy may be applicable in other invasive procedures such as endoscopies, sigmoidoscopies, or interventional radiological exams. "It would be nice to offer it to all of our patients," Diette says. "It should not be thrust upon them, but it would be nice if they had a choice."

Expense would not be a problem. "The Bedscapes retail for $249 apiece, which includes the screen, the means to hang the screen, and the tape. Theoretically, it is reusable, so two or three could go a long way," says Diette.

How does Diette feel about the fact that many would categorize this approach as an "alternative medicine" intervention? Does he believe alternative medicine has a role in improving quality of care? "I think the answer is 'yes,' to the extent that we can test these kinds of things and demonstrate that they should be part of conventional medicine," he replies.

"If we subject them to the same kind of rigorous testing, they ought to be incorporated. This is an exciting and basically a harmless intervention," Diette explains. ■

Need More Information?

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American Health Consultants
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Aftermath of ergonomics	1	2	3	4	5
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Post-exposure prophylaxis	1	2	3	4	5
Influenza update	1	2	3	4	5
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Drug interactions	1	2	3	4	5
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Pain management	1	2	3	4	5

	No Interest		Some Interest		Much Interest
Palliative care	1	2	3	4	5
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